1107-86-249 **Ian Grooms*** (grooms@cims.nyu.edu), Courant Institute of Mathematical Sciences, New York University, 251 Mercer St, New York, NY 10012, and **Yoonsang Lee** and **Andrew J Majda**.
Ensemble filtering and low-resolution model error: Covariance inflation, stochastic parameterization, and model numerics.

Using under-resolved models in ensemble filters leads to two kinds of model errors: truncation errors associated with discretization of the large-scale dynamics, and errors associated with subgrid scale interactions. Covariance inflation can account for model errors in ensemble Kalman filters, but does not reduce model error. Numerical errors can be reduced by increasing the accuracy of the discretization, and parameterizations can reduce errors associated with subgrid interactions. Stochastic parameterizations reduce the model error and inflate the ensemble spread, so the effectiveness of stochastic parameterizations can be gaged by comparing with covariance inflation. We compare covariance inflation, stochastic parameterization, and model numerics in two regimes of quasigeostrophic turbulence. Fourth-order discretization and stochastic parameterization both have a positive impact when compared with a second-order model with no parameterization. In homogeneous turbulence on an f-plane the improvements from stochastic parameterization exceed theose from multiplicative inflation, which exceed those from fourth-order numerics. With strong zonal jets on a β-plane stochastic parameterizations and fourth-order numerics are both superior to covariance inflation. (Received January 16, 2015)